

Brief Communication: Type II Tooth Cusp Occurrence Asymmetry in a Human Monozygotic Twin Pair

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ABSTRACT A Type II tooth cusp occurrence asymmetry proposed for human twins in 1974 but not observed until recently was described in a female monozygotic twin pair. *Am J Phys Anthropol* 105:93-95, 1998.

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In a previous study (Staley and Green, 1974) the types of tooth cusp asymmetries possible in human twin pairs were described, and frequencies for the occurrence of the types were given for a sample of 90 monozygotic and 90 dizygotic twin pairs. Of the four possible types of asymmetry, examples were reported for three of the types: Type I which involves a bilateral asymmetry in one of the twins, Type III which involves a reversed bilateral asymmetry within the pair, also known as mirror imagery, and Type IV in which both teeth of twin 1 are bilaterally symmetric but differ from both teeth of twin 2 which are also bilaterally symmetric. No examples were found among the 180 twin pairs for Type II asymmetry in which each twin has an identical bilateral asymmetry. This type of twin pair cusp occurrence asymmetry has not been previously reported.

The purpose of this article is to report and describe a Type II cusp occurrence asymmetry in one monozygotic twin pair.

MATERIALS AND METHODS

The teeth of a Caucasian female monozygotic twin pair, ages 9 years, 9 months, from Newton, Iowa, were examined on plaster casts. Zygosity was determined on the basis

of placental findings by the physician who delivered the twins and by close resemblance in the physical characteristics of the sisters. The maxillary deciduous second molars of two samples of white children were examined for the occurrence of the unusually shaped molars observed in the pair of monozygotic twins reported here: 1) 253 participants in the Twin Growth Study at the Department of Orthodontics at the State University of New York at Buffalo (Staley and Green, 1971) and 2) 182 participants in the Iowa Facial Growth Study (Meredith and Hopp, 1956).

RESULTS

Figures 1 and 2 illustrate the bilateral asymmetry observed in the deciduous maxillary second molars of the female twins. In Figure 3, the cusps present are labeled in drawings of occlusal views of the four deciduous second molars. The molars on the left side have the typical morphology seen in deciduous maxillary second molars. The molars on the right side have large Carabelli cusps, enlarged distolingual cusps (hypo-

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Fig. 1. An occlusal view of the maxillary arch of twin number 1 showing the normal morphology of the left deciduous second molar and the anomalous morphology of the right deciduous second molar.

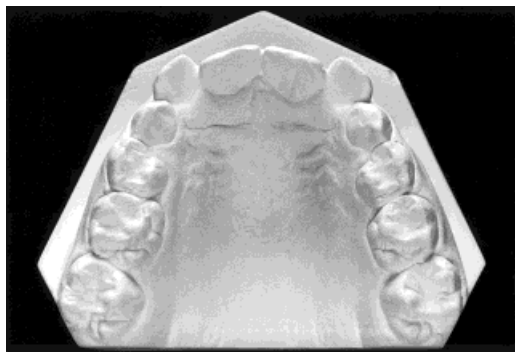


Fig. 2. An occlusal view of the maxillary arch of twin number 2 showing the normal morphology of the left deciduous second molar and the anomalous morphology of the right deciduous second molar.

cones), and accessory cusps on the lingual surfaces between the distolingual and Carabelli cusps. The left molars had mesiodistal and buccolingual dimensions (8.9 mm and 10.0 mm and 9.0 mm and 9.85 mm, respectively) that were within one standard deviation of the mean dimensions for second molars in a sample of 139 Caucasian children (Maynard et al., 1994). The anomalous right molars were greater than one standard deviation larger in mesiodistal and buccolingual dimensions (9.8 mm and 10.0 mm and 9.4 mm and 10.5 mm, respectively) than the mean dimensions for the afore mentioned sample of 139 children.

An examination of the deciduous molars among the participants of the Buffalo and

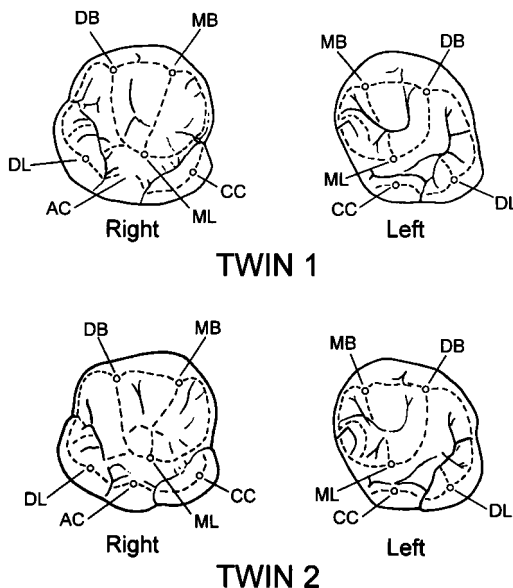


Fig. 3. Drawings of the deciduous second molars of both twins. Solid lines are outer surfaces and grooves; broken lines are crests of ridges. Cusps are mesiobuccal (MB), distobuccal (DB), mesiolingual (ML), distolingual (DL), Carabelli cusp (CC), and accessory cusp (AC).

Iowa growth samples revealed one subject in each sample who had a deciduous maxillary second molar that resembled the anomalous molars observed in the twins described here. In both subjects, the similar anomalous molar occurred asymmetrically. The frequency for the occurrence of these anomalous molars was 0.55% for the Iowa Growth Study sample and 0.4% for the Buffalo Twin Growth Study sample. The anomalous molar in the Buffalo study sample is illustrated in a publication (Staley, 1979). Jørgensen (1956) did not describe a similar anomalous molar in his monograph on the deciduous dentition.

DISCUSSION

The asymmetric appearance of the rare anomalous molars observed in this pair of monozygotic twins provides an interesting confirmation that Type II cusp occurrence asymmetries can occur in a twin pair. The rarity of cusp asymmetries in the teeth of monozygotic twins assures that Type II asymmetries will be observed very infrequently in identical twins. The bilaterally

asymmetric molars described in this paper are examples of genotypic asymmetries as described by Dahlberg (1943).

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